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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,458	08/07/2003	Gino Tanghe	920522-94653	3468

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BARNES & THORNBURG LLP  
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EXAMINER
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BECK, ALEXANDER S

ART UNIT	PAPER NUMBER
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2629

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/637,458		TANGHE ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Alexander S. Beck		2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### Response to Request for Continued Examination

1. Acknowledgment is made of the Request for Continued Examination filed by the Applicant on October 13, 2006, in which: Claims 1,15 and 28 are amended. Claims 1-28 are currently pending in U.S. Application Serial No. 10/637,458, and an Office Action on the merits follows.

### Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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3. Claims 1-3,5,15,16,18-21 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent No. 5,594,463 A, hereinafter SAKAMOTO) in view of Shen et al. (U.S. Patent No. 6,414,661 B1, hereinafter SHEN).

As to independent Claims 1,15 and 28, SKAMOTO teaches/suggests in FIGS. 5-6,8 a method and means of a control device for optimizing lifetime of a light emitting element, the light emitting element comprising a plurality of addressable discrete light emitting pixels, each of said light emitting pixels being driven by a supply voltage and a drive current provided by a current driver, each light emitting pixel having a threshold voltage, the method and means comprising, for an light emitting pixel: means for determining an environmental parameter which affects aging of an light emitting pixel (SAKAMOTO: col. 7, line 67 – col. 8, line 9), means for determining a first operational parameter indicative of aging of the light emitting pixel (SAKAMOTO: col. 7, lines 35-46), and means for compensating at least partly for aging by changing a second operating parameter of the light emitting pixel based on the determination of the environmental parameter and the first operational parameter (SAKAMOTO: col. 7, lines 51-57).

SAKAMOTO does not disclose expressly wherein the light emitting element is an organic light emitting diode (OLED); calculating the OLED pixel lifetime and light output; and changing the second parameter in a way that the OLED pixel lifetime and light output are optimized.

The Examiner takes Official Notice that the use of OLEDs as light emitting elements arranged in a matrix in a flat panel display is old and well-known in the art.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the teachings of SAKAMOTO such that OLEDs were used as light emitting elements.

The suggestion/motivation for doing so would have been because, among many advantages, it is well-known that OLEDs have a low cost of production.

SHEN, analogous in art with SAKAMOTO, teaches/suggests a method and apparatus for calibrating display devices comprising calculating the OLED pixel lifetime and light output (e.g. decay in light output efficiency of each pixel based on the accumulated drive current applied) and changing the second parameter in a way that the OLED pixel lifetime and light output are improved (e.g. deriving and applying a correction coefficient that is applied to the next drive current for each pixel so as to improve lifetime and light output) (SHEN: abstract).

It has been held that the discovery of an optimum value of a result effective variable is generally considered to be within the skill of the art. In re Boesch, 205 USPQ (BNA) 215.

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the teachings of SAKAMOTO such that method for optimizing a lifetime of an OLED display element comprised calculating the OLED pixel lifetime and light output and changing the second parameter in a way that the OLED pixel lifetime and light output are improved, as taught/suggested by SHEN, wherein the parameter changed to improve lifetime and light output are selected to as to optimal.

The suggestion/motivation for doing so would have been to drive a display device such that the loss in efficiency over time was automatically compensated most effectively (SHEN: abstract).

As to Claims 2 and 19, SAKAMOTO teaches/suggests wherein compensation means for changing the second operational parameter is at least one of on-time of the current driver or supply voltage to the light emitting pixel (SAKAMOTO: col. 7, lines 43-45, 51-57).

As to Claims 3 and 16, SAKAMOTO teaches/suggests wherein means for determining the environmental parameter is obtained by measuring a temperature of the light emitting pixel (SAKAMOTO: col. 7, line 66 – col. 8, line 9).

As to Claims 5 and 18, SAKAMOTO teaches/suggests wherein the means for determining a first operational parameter is obtained by measuring a voltage across the current driver to determine the threshold voltage or normal operating voltage of the light emitting pixel (SAKAMOTO: col. 7, lines 35-46).

As to Claim 20, SAKAMOTO teaches/suggests a memory element for storing the measured temperature for at least one light emitting pixel (SAKAMOTO: col. 6, lines 18-21).

As to Claim 21, SAKAMOTO teaches/suggests a memory element for storing the measured voltage across the current driver for at least one light emitting pixel (SAKAMOTO: col. 6, lines 18-21).

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4. Claims 4,7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent No. 5,594,463 A) and Shen et al. (U.S. Patent No. 6,414,661 B1) as applied to Claims 1-3,5,15,16,18-21 and 28 above, and further in view of Numao (Japanese Publication No. 2002278514 A, hereinafter NUMAO).

As to Claims 4 and 17, SAKAMOTO teaches/suggests wherein the means for determining an environmental parameter is a temperature measurement means for measuring an ambient temperature (SAKAMOTO: col. 7, line 66 – col. 8, line 9).

Neither SAKAMOTO nor SHEN disclose expressly means for estimating a temperature of the light emitting pixel from the ambient temperature.

NUMAO, analogous in art to the teachings of both SAKAMOTO and SHEN, teaches/suggests means for measuring an ambient temperature and estimating a temperature of a light emitting pixel from the ambient temperature (NUMAO: English abstract translation).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the teachings of SAKAMOTO and SHEN such that a temperature of a light emitting pixel was estimated from an ambient temperature measured, as taught/suggested by NUMAO.

The suggestion/motivation for doing so would have been to better correct for the aging of a display by estimating the temperature of the light emitting elements (NUMAO: English abstract translation).

As to Claim 7, SAKAMOTO teaches/suggests storing the measured temperature for at least one light emitting pixel (SAKAMOTO: col. 6, lines 18-21).

5. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent No. 5,594,463 A) and Shen et al. (U.S. Patent No. 6,414,661 b1) as applied to Claims 1-3,5,15,16,18-21 and 28 above, and further in view of Ochi et al. (U.S. Patent No. 6,376,994 B1, hereinafter OCHI).

As to Claim 6, SAKAMOTO teaches/suggests measuring the voltage across the current driver to determine an amplitude change required for a voltage across the light emitting pixel to attain its threshold voltage or its normal operating voltage (SAKAMOTO: col. 3, lines 5-11; col. 7, lines 35-46).

Neither SAKAMOTO nor SHEN disclose expressly wherein a change in time duration required is determined.

OCHI, analogous in art to the teachings of both SAKAMOTO and SHEN, teaches/suggests wherein, as an alternative to determining an amplitude required to attain a luminance (i.e., normal operating voltage), a change in time duration is determined to attain a luminance (OCHI: col. 11, lines 17-21,39-45; col. 11, line 60 – col. 12, line 9).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the teachings of SAKAMOTO and SHEN such that a change in time duration of the current source (as opposed to a change in amplitude level of the current source as previously taught) was determined to attain a luminance (i.e., normal operating voltage), as taught/suggested by OCHI.



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The suggestion/motivation for doing so would have been to provide an additional means for attaining a nominal luminance across a display, other than changing an amplitude level of a current source (OCHI: col. 11, lines 17-21,39-45; col. 11, line 60 – col. 12, line 9).

As to Claim 8, SAKAMOTO teaches/suggests storing the measured voltage across the current driver for at least one light emitting pixel (SAKAMOTO: col. 6, lines 18-21).

6. Claims 9,10,22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent No. 5,594,463 A) and Shen et al. (U.S. Patent No. 6,414,661 B1) as applied to Claims 1-3,5,15,16,18-21 and 28 above, and further in view of Suzuki (U.S. Patent No. 6,369,786 B1, hereinafter SUZUKI).

As to Claims 9,10,22 and 23, note the above discussion of SAKAMOTO and SHEN with respect to independent Claims 1 and 15, respectively.

Neither SAKAMOTO nor SHEN disclose expressly determining an optimal pre-charge required for each light emitting element, and the determining an optical pre-charge comprises determining a light emitting element drive voltage.

SUZUKI, analogous in art to the teachings of both SAKAMOTO and SHEN, teaches/suggests a flat panel display with light emitting elements arranged in a matrix comprising determining an optimal pre-charge required for each light emitting element, and wherein the determining of an optical pre-charge comprises determining a light emitting element drive voltage. (SUZUKI: col. 4, lines 27-62).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the teachings of SAKAMOTO and SHEN such that an optimal pre-charge required for each light emitting element was determined, and wherein the determining of an optical pre-charge comprised determining a light emitting element drive voltage, as taught/suggested by SUZUKI.

The suggestion/motivation for doing so would have been to suppress the influence of a stray capacitance developed at intersections of the electrodes in the matrix configuration (SUZUKI: abstract).

7. Claims 11-13,24,25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent No. 5,594,463 A) and Shen et al. (U.S. Patent No. 6,414,661 B1) as applied to Claims 1-3,5,15,16,18-21 and 28 above, and further in view of Mazurek et al. (U.S. Patent No. 5,805,117 A, hereinafter MAZUREK).

As to Claims 11-13,24,25 and 27, note the above discussion of SAKAMOTO and SHEN with respect to independent Claims 1 and 15, respectively.

Neither SAKAMOTO nor SHEN disclose expressly wherein the method is applied to a tiled display comprising a plurality of light emitting element display tiles, means for reducing temperature differences over two different light emitting element display tiles, and wherein reducing temperature differences over two different light emitting element display elements comprises adjusting a cooling.

MAZUREK, analogous in art to the teachings of both SAKAMOTO and SHEN, teaches/suggests a tiled display comprising a plurality of light emitting element display

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tiles (MAZUREK: col. 6, lines 7-13), means for reducing temperature differences over two different light emitting element display tiles, and wherein reducing temperature differences over two different light emitting element display elements comprises adjusting a cooling (MAZUREK: col. 6, lines 7-13).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the teachings of SAKAMOTO and SHEN such that the method was applied to a tiled display comprising a plurality of light emitting element display tiles and adjusting a cooling to reduce temperature differences over two different light emitting element displays, as taught/suggested by MAZUREK.

The suggestion/motivation for doing so would have been to provide one large display by tiling a plurality of displays (MAZUREK: col. 6, lines 7-13) and to maintain a relatively cool operating temperature among the plurality of displays (MAZUREK: col. 6, lines 7-13).

8. Claims 14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent No. 5,594,463 A) and Shen et al. (U.S. Patent No. 6,414,661 B1) as applied to Claims 1-3,5,15,16,18-21 and 28 above, and further in view of Hanaki et al. (U.S. Patent No. 6,337,542 B1, hereinafter HANAKI).

As to Claims 14 and 26, note the above discussion of SAKAMOTO and SHEN with respect to independent Claims 1 and 15, respectively.

Neither SAKAMOTO nor SHEN disclose expressly means for setting intensity and contrast of light emitting pixels within predefined limits to reduce aging of the light emitting display element.

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HANAKI, analogous in art to the teachings of both SAKAMOTO and SHEN, teaches/suggests a flat panel display with light emitting elements arranged in a matrix comprising means for setting intensity and contrast of light emitting pixels within predefined limits to reduce aging of the light emitting display element (HANAKI: col. 7, lines 43-57).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the teachings of SAKAMOTO and SHEN such that means for setting intensity and contrast of light emitting pixels within predefined limits to reduce aging of the light emitting display element were included, as taught/suggested by HANAKI.

The suggestion/motivation for doing so would have been to prolong the length of time in which the difference in degradation between light emitting elements is maintained small (HANAKI: col. 7, lines 43-57).

#### Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander S. Beck whose telephone number is (571) 272-7765. The examiner can normally be reached on M-F, 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

asb  
12/19/06

  
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SUPERVISORY PATENT EXAMINER